SYLLABUS
FOR

M.A. / M.Sc.

in

GEOGRAPHY
NEP-2020

DEPARTMENT OF GEOGRAPHY
SCHOOL OF SCIENCES
NAGALAND UNIVERSITY, LUMAMI-798627
ZUNHEBOTO, NAGALAND
2025

PREAMBLE

The Department of Geography since its inception in 1997 started M.A. / M.Sc. and Ph.D. Programmes with the following aims.

1. To impart knowledge for understanding the discipline of Geography for a holistic comprehension of man- environment relationship and problems emerging therein regarding rational utilization and management of resources and environment for good quality of life.
2. To sharpen the tools and techniques of analysis, interpretation and understanding as well as incorporation of new technological for innovations for a better comprehension of the living environment.
3. To ventilate issues and questions regarding geographical, resources planning and development and to help in achieving the sustainable development.
4. To initiate career- oriented professional and specialized course programmes.

It has been a sincere endeavor of the Department to revise its syllabus from time to time to keep abreast with the latest trends in the field of Geography. Under the University‟s direction the Department has introduce Choice Based Credit System (CBCS), and now NEP 2020. Salient features of the Revised Syllabus are as follows:

1. The M.A. / M.Sc. Programme in Geography shall be of a total of 80 Credits (1800 Marks) including theory papers, practical, study tour and dissertation.
2. The entire credits to be earned have been spread over Four Semesters.
3. Credit distribution of the courses ranges between 4 to 10 in the paper.
4. All courses categorized as core paper (CP) are compulsory. Under Choice Based Credit Papers, student will have option to study one optional paper in the Third Semester. Under NEP, Fourth semester will be carrying only 200 marks and entirely dedicated for research based.
5. Division of marks carrying 100 Marks shall be two Sessionals (C1 & C2) , carrying 40 marks (40%) and End semester 60 marks (60%).
6. Pass marks for Sessional/ Mid- term and End Semester is 40% separately for all courses.
7. It is mandatory for the students to secure pass marks (40%) in Sessional/ Mid- term to appear the End Semester Examinations in all courses.
8. Individual student is required to maintain minimum 75% of class attendance to be eligible to appear End Semester Examinations.
9. The intake capacity is 30 students only. Along with this intake, an additional 10% seat (3) will be under the supernumerary category. The students who are Graduated from the Arts background (B.A.) will get Master of Arts in Geography (M.A.) and those who are Graduated from the Science background (B.Sc.) will get Master of Science in Geography (M.Sc.) Degree.
10. The M.A./ M.Sc. Programme has an essential course requirement of field study at the local level (any place within the State of Nagaland), Physical / Socio-Economic Survey.
11. In the Research Project and Research Internship paper, students must secure pass marks (40%) in the research internship sections and also must obtained 75% of class attendance to be eligible to the Research Project submission.
12. Students who exit at the end of 1st Year shall be awarded a Postgraduate Diploma

Sd/-

Date: 18.04.2025 *Head of the Department*

NEP COURSE STRUCTURE FOR M.A. / M.Sc. PROGRAMME IN GEOGRAPHY

Course No.	Title of the Course	Credits	Marks	Page No.
FIRST SEMESTER (20 Credits / 500 Marks)				
GEOG 101	Geomorphology	4	100	4
GEOG 102	Economic Geography	4	100	5
GEOG 103	Regional Geography of India	4	100	6
GEOG 104	Geographical Thought	4	100	7
GEOG 105	Cartographic and Quantitative Techniques *(Practical)*	4	100	8
SECOND SEMESTER (20 Credits / 500 Marks)				
GEOG 201	Climatology and Oceanography	4	100	9
GEOG 202	Biogeography	4	100	10
GEOG 203	Political Geography	4	100	11
GEOG 204	Remote Sensing and Geographical Information System	4	100	12
GEOG 205	Remote Sensing Techniques and Computer Cartography *(Practical)*	4	100	13
FIRST YEAR (40 Credits / 1000 Marks)				
THIRD SEMESTER (20 Credits / 500 Marks)				
GEOG 301	Research Methodology	4	100	15
GEOG 302	Application of Remote Sensing, GIS And GPS in Geography	4	100	16
GEOG 303	Massive Open Online Courses(MOOC)	2	50	18
GEOG 304	Internship	2	50	18
GEOG 305	Field Work: Physical / Socio-Economic Survey *(Practical)*	4	100	19
(GEOG 306-3010)	Choice Based (Any one from the five papers)			
GEOG 306	Geography of North East India and Nagaland	4	100	20
GEOG 307	Natural Hazards and Disaster Management	4	100	21
GEOG 308	Geography of Tourism	4	100	22
GEOG 309	Cultural Geography	4	100	23
GEOG 310	Agricultural Geography	4	100	24
FOURTH SEMESTER (20 Credits / 500 Marks)				
GEOG 401	Research Project	20	500	25
SECOND YEAR (40 Credits / 1000 Marks)				
	TOTAL	**80**	**2000**	

*Students who exit at the end of 1st Year shall be awarded a Postgraduate Diploma

*Students are encouraged to take SWAYAM platform- MOOC course during the 3rd semester, and marks will be transferred to her/his Academic Bank of Credit.

FIRST SEMESTER

Course- GEOG: 101 GEOMORPHOLOGY

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional / Mid- term: 40**
End Semester Evaluation: 60

Objectives:

- It being a course at the interface of Geography with earth, the student has to be sensitized to background knowledge of geology and environmental sciences.
- The objectives of the course is to familiarize the students with the need for understanding of geomorphology with reference to certain fundamental concepts, focusing on the unity of geomorphology in the earth materials and the processes with or without an element of time. Processes of landscape evolution.
- Finally a few selected applications of geomorphology to societal requirements and quality of environment are dealt with.

Course Contents:

Unit- I: Nature and scope of Geomorphology, evolution of geomorphological thoughts and fundamental concepts, uniformitarianism and diastrophism, endogenic and exogenic processes, concept of gradation and threshold, geological timescale.

Unit- II: Geological structures of the Earth, seismicity, volcanicity, isostasy, continental drift, plate tectonics and sea floor spreading, mountain building with reference to the Himalayas.

Unit- III: Fluvial process and landforms, drainage pattern and channel morphology, glacial, periglacial and paraglacial processes and landform evolution, work of ocean and coastal landforms, soil development and profile, weathering and mass movement, methods to quantify the rates and dates of landform evolutions.

Unit- IV: Hydro-geomorphic problems and measures in eastern Himalayas, techniques for landslide and soil loss assessment, analysis of sediments through shape indices and textural analysis by sieving, problems and management of landslides and soil loss in Nagaland, urban geomorphology in humid tropics and significance in town planning.

Suggested Readings

1. Chorley, R.J.: Spatial Analysis in Geomorphology, Methuen, London, 1972.
2. Cooke, R.U. and Doornkamp,J.C.: Geomorphology in Environmental Management- A introduction, Clarendon Press, Oxford, 1974.
3. Dury, G.H.: The Face of the Earth, Penguin Harmondsworth, 1959.
4. Fairbridge, R.W. Encyclopedia of Geomorphology, Reinholdts, New York, 1968.
5. Goudie, A.: The Nature of the Environment, Oxford & Blackwell, London, 1993.
6. Garner, H.F.: The Origin of Landscapes- A Systematic of Geomorphology, Oxford University Press, London.1975.
7. Mitchell,C.W.: Terrain Evaluation, Longman, London. 1973.
8. Oillier, C.D.: Weathering, Longman, London, 1979.
9. Pitty, A.F. Introduction to Geomorphology, Methuen, London, 1971.
10. Rawat, M.S. Environmental Geomorphology and Watershed Management. Concept N. Delhi.
11. Stoddart, D.R. (e.d.): Process and form in Geomorphology, Routledge, New York, 1996.
12. Skinner,B.J.& Porter,S.C.: The Dynamic Earth John Wiley, New York,1995.
13. Sparks, B.W. Geomorphology, Longman, 1960.
14. Sharma, H.S.(e.d.): Perspectives in Geomorphology, Concept, New Delhi,1980.
15. Singh,S.: Geomorphology, Prayag Publication,Allahabad,1988.
16. Thornbury, W.D. Principles of Geomorphology, John Wiley,New York,1960.
17. S., Kale Vishwas, Introduction to Geomorphology. Orient Longman, 2001.
18. Sharma, K. et al., (eds.) Geomorphology and Environmental Sustainability. Concept N. Delhi.
19. Sharma, H.S.: Environmental Geomorphology. Concept Publishing Co. New Delhi.

Pedagogy

- Geomorphology is essentially a field science, therefore students be taken to the field for effective understanding of geomorphic forms and processes. Department must have good geomorphic lab equipped with photographs of landforms of various climatic regions and toposheets of Survey of India.
- Students may visit any national/foreign laboratory related to the subject matter.

GEOG: 102 ECONOMIC GEOGRAPHY

Credit Points: 4
Contact Hours: 4 hrs per week

Marks : 100
Sessional / Mid- term: 40
End Semester Evaluation:60

Objectives:

- To understand the changing nature of economic development in the contemporary world.
- To integrate the various factors of economic development and to acquaint the students about dynamic aspects of economic geography.
- To explore the potentiality of the economic development in the Northeast Region and to suggest suitable strategy plan.

Course Contents:

Unit- I: Scope, content and recent trends in economic geography, relation of economic geography with economics and other branches of social sciences, Location of economic activities and spatial organization of economics, Classification of economics; sectors of economy (primary, secondary and tertiary).

Unit- II: Classification of industries; Resource based and footloose industries, Theories of industrial location- Weber. Losch and Isard; Case studies of selected industries iron and steel, Aluminum, Chemical, Oil refining and Petrochemical, Engineering, Textile etc.

Unit- III: Modes of transportation and transport cost; accessibility and connectivity; international, inter and intraregional cost advantages, Typology of markets, market network in rural societies, market system in urban economy, role of market in the development of trade and commerce.

Unit- IV: Globalization and Economic development of India. Regional disparities. Economic development of NEI with special reference to Nagaland (Underdevelopment and Strategy for development).

Suggested Readings:

1. Anderson William, P. Economic Geography 2012, Routledge London.Berry J.L.Geography of Market Centers and Retail Distribution, Prentice Hall, New York, 1967.
2. Chatterjee, S, P.: Economic Geography of Asia, Allied Book Agency, Calcutta, 1984.
3. Chorley, R.J. and Haggett, P. (e.d.): Network Analysis in Geography, Arnold, 1969.
4. Dreze, J. and Sen, A.: India-Economic Development and Social Opportunity, Oxford University Press, New Delhi, 1996
5. Eckarsley, R. (e.d.): Markets, the state and the Environment, McMillan, London, 1995.
6. Garnier.B.J. and Delobez, A Geography of Marketing, Longman, London, 1979.
7. Gautum, alka. Advanced economic geography, 2018, Sharda Pustak Bhuvan, Allahabad.
8. Hamilton, F.E.I.: Spatial Perspectives on Industrial Organization and Decision Making, John Wiley, New York 1974.
9. Hamilton.I. (e.d.): Resources and Industry, Oxford University Ptress, New York, 1992.
10. Hurst E: Transport Geography- Comments and Readings, Mc Graw Hill, New York, 1974.
11. Morgan, WB and Munton R.J.C.: Agricultural Geography, Methuen, London, 1977.
12. Pachuri, R.K.Energy and Economic Development in India, Praeger, New York, 1977.
13. Robertson, D. (e.d.): Globalization and Environment, E. Elgar Co., U.K., 2001.
14. Rotsow, W.W.: The Stages of Economic Growth, Cambridge University Press, London, 1960.
15. Singh J. and Dhilion. S.S. Agricultural Geography, McGraw Hill, India, New Delhi, 1984.
16. Symons. L: Agricultural Geography, Bell and Sons, London, 1972.
17. Wheeler, J.O. e.t. al: Economic Geography, John Wiley, New York, 1995.

Pedagogy

- The students should be acquainted with the different branches of economic geography with examples. They should be motivated to interact with the teacher to identify economic activities of the people residing in different parts of the world.

GEOG: 103 **REGIONAL GEOGRAPHY OF INDIA**

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional / Mid- term: 40**
End Semester Evaluation: 60

Objectives:

- To understand India in terms of various regional divisions, their impact characteristics; to analyse the natural and human resource endowments.
- To sensitize the students with development issues and policies and programmes designed for regional development.

Course Contents:

Unit- I: Physiographic setting, Drainage system, Geological setting, Origin and mechanism of the Indian monsoon, Climate and Climatic region, Agro-climatic region, Soils and natural vegetation distribution.

Unit- II: Population Distribution- Sex ratio, age structure, literacy. Fertility and mortality, Population problems and Policies. Migration. Genesis of ethnic/racial diversities; tribal areas and their problems. Morphology of rural settlement, Urban morphology. Urban Sprawl.

Unit- III: Agricultural regionalization, Green revolution, Livestock resources and White Revolution; Dry zone agriculture. Industrial regionalization, Special Economic Zones. Industry types- Mineral-based, Agro-based and Forest-based industries. Transport network development. Major industries-Iron and steel, cement, paper, fertilizers.

Unit- IV: Geography of North East region of India; Physiography, Climate, Drainage system, Demographic setting; population, Population distribution, Language and religion. Cultural diversities in Northeast India. Industry, Immigration issues, Regional development.

Suggested Readings

1. Centre for Science & Environment (1988), State of India‟s, Environment, New Delhi
2. Deshpande, C.D. (1992), India: A Regional Interpretation, ICSSR & Northern Book Centre.
3. Dreze, Jean & Amartya Sen (ed.) (1996), India‟s Economic Development and Social Opportunity, Oxford University Press, New Delhi.
4. Khullar, D.R. (2006), India: A Comprehensive Geography, Kalyani Publishers, New Delhi.
5. Robinson, Francis (1989), The Cambridge Encyclopedia of India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan & Maldives, Cambridge University Press, London.
6. Sen Gupta, P. Economic Regionalization of India, Census of India Publication, 1968.
7. Singh R.L. (ed.) (1971), India-A Regional Geography, National Geographical Society, India, Varanasi.
8. Tirtha R. & Krishan, Gopal (1996), Emerging India, Reprinted by Rawat Publications, Jaipur.

Pedagogy:

- Students should be involved in classroom discussions and exercises on regions as reported in the Print and the Visuals.
- Discussion on the developmental activities, its process of development and transformation.
- Assignments involving development oriented topics, followed by seminars and brain storming sessions.

GEOG-104 GEOGRAPHICAL THOUGHT

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional/ Mid- term: 4 0**
End Semester Evaluation: 60

***Objective*:**

- To introduce the students to the philosophical and methodological foundations of the subject and its place in the world of knowledge.
- To familiarize them with the major landmarks in development of geographic thought at different periods of time.

Course Contents:

Unit– I: The field of geography; its position in the classification of sciences; geography as a social science; and natural science; areal differentiation and spatial organization.

Unit- II: Dualisms in geography; systematic & regional geography; physical & human geography. Systematic geography & its relation with systematic sciences and with regional geography. Regional geography: Concept of region.

Unit- III: Scientific explanations: routes to scientific explanations (Inductive/Deductive); types of explanations; cognitive description; cause & effect; temporal; functional/ecological systems. Laws, theories & models, the quantitative revolution, responses to positivism, behaviorism, postmodernism, radacilism, neo-determinism, neo-environmentalism, structuralism and post-structuralism, the gender question..

Unit– IV: Contributions of different scholars during ancient medieval and modern period.
Geography in the 20th century; conceptual and methodological developments and changing paradigms; status of Indian Geography, Future of geography; task ahead relating to development of geographic thought with special reference to changing views on man-environment relationship.

Suggested Readings:

1. Albert, Ronald; Adams, John S.Gould, Peter: Spatial Organization: The Geographer‟s View of the World, Prentice Hall, N.J., 1971.
2. Ali. S.M.: The Geography of Puranas, Peoples Publishing House, Delhi, 1966.
3. Amedeo, Douglas: An Introduction to Scientific Reasoning in Geography, John Wiley, U.S.A., 1971.
4. Dikshit, R.D. (e.d.): The Art & Science of Geography Integrated Readings, Prentice Hall, New Delhi, 1994.
5. Hartshorne, R.: Perspective on Nature of Geography, Rand Mc Nally & Co., 1959.
6. Husain,M.: Evolution of Geographic Thought, Rawat Pub., Jaipur,1984.
7. Johnston, R.J.: Philosophy and Human Geography, Edward Arnold, London, 1983.
8. Johnston, R.J.: The Future of Geography, Methuen, London, 1988.
9. Minshull, R.: The Changing Nature of Geography, Hutchinson University Library, London, 1970.

Pedagogy:

- Students of geography may be encouraged to interact with their counterparts from other disciplines and discuss the nature of their subject.
- The students may be encouraged to collect information on any theme amenable to geographical interpretation.

GEOG: 105 CARTOGRAPHIC AND QUANTITATIVE TECHNIQUES (*Practical)*

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional/ Mid- term: 4 0**
End Semester Evaluation: 60

Objectives:

- To apprise the student with latest trends in the development of cartography as a tool in mapping thematic and quantitative data to facilitate spatial analysis and synthesis.
- To provide training in application of modern tools and techniques to data in variety of topical and regional studies at local, regional and national levels.
- To attempt regional by the use of cartographic and quantitative techniques.

Course Contents:

Cartographic Techniques

Unit- I: Topographic Profiling (Simple, superimposed, composite and projected profiles), Morphometric analysis of drainage basin: Relative Relief Map, Average Slope Zone map, Dissection Index Map, Stream ordering, Drainage Density map, Drainage pattern diagrams).

Unit- II: Techniques of analysis of socio- economic data through the preparation of single purpose and composite maps. Morphometric Analysis of glaciers (Equilibrium Line Altitude, Mass Balance). Weather map interpretation and climate data representation technique (Climograph, Isotherm, Isohyet), Soil and Water physio-chemical property analysis and mapping.

Quantitative Techniques

Unit- III: Sampling: basic concepts, types of sampling, standard error – Data sources and types of data; Frequency distribution and cumulative frequency; Measures of Location or Central Tendency (Arithmetic and Geometric Mean, Median and Mode), Measures of Dispersion or variability (Range, Standard deviation, Mean deviation, and Quartile deviation), Measures of Relative Dispersion (Co-efficient of Variation).

Unit- IV: Correlation- Spearman's Rank order correlation & Karl Pearson's Product Moment Correlation; Simple Regression; Chi-square test, Variance test, Test of significance- 't'test , , Measures of Spatial Inequality- Lorenz Curve, Gini"s Coefficient, Time series data Analysis.

Suggested Readings:

1. Alvi, Zamir (1995) "Statistical Geography" Methods and applications, Rawat, pub, Jaypur.
2. Aslam Mahmood "Statistical Methods in Geographical Studies" Rajesh Pub, New Delhi.
3. R. Hammond and P. Mccullagh "Quantitative techniques in Geography".
4. Aurther H. Robinson "Elements of Cartography", John wily and sons, inc., New York.
5. G.R.P. Lawrence "Cartographic Methods" Methuen and Co. Ltd. 1971.
6. Gopal Singh- Practical Geography.
7. Misra R.P. and Ramesh (1989) Fundamentals of Cartography, concept publishing Co. New Delhi.
8. Nag, P. ed., (1992) Cartography and Remote Sensing, concept publishing Co. New Delhi.
9. Robinson, AH, Sale AH. Morrison JL and Muerake (1985) Elements of Cartography, John wiles and sons NY.
10. Menno- Jan Karaak & Ferjan Ormeling " Cartography visualization of Geospatial data" Pearson education ltd., UK (2003)
11. Anson, R.W and F.J. Ormeling (eds) „Basic Cartography for students and technicians, Oxford; Butterworth-Heinemann, (2002)
12. Brewer, C.A (1994) Colour use guidelines for mapping and visualization "Visualization in Modern Cartography" Oxford/NY
13. Hearnshaw, H.M. and D.J. Unwin (1994) "visualization in GIS, London, L.Wiley and sons.
14. Hammond R. Introduction Quantitative techniques in Geography, Mc. Graw Hill.

Pedagogy:

- The students need to be trained in the use of conventioned vis-à-vis modern tools and techniques of cartographic analysis to generate spatial pattern and associations and attempt a geographical interpretation.

- They should be encouraged to create spatial database for their interested areas based on satellite imageries and remote sensing techniques and other kinds of maps.

SECOND SEMESTER

GEOG: 201 CLIMATOLOGY AND OCEANOGRAPHY

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional/ Mid- term: 4 0**
End Semester Evaluation: 60

Objectives:

- The aim of the course is to provide an understanding of weather phenomena; dynamics of global climates and generation of climatic information and their application.

Course Contents:

Climatology

Unit- I: Definition, nature and scope of Climatology and meteorology. Composition, mass and structure of atmosphere. Insolation and heat balance of the earth. Atmospheric circulation; Climate change and its impact: Astronomical causes, Other natural causes and Anthropogenic causes.

Unit- II: Air masses and atmospheric disturbances; Tropical and temperate cyclones. Western Disturbances, North-East monsoon and Indian Summer monsoon; Theories of Monsoon wind system; Climate change in North-East India.

Oceanography

Unit- III: Definition nature and scope of Oceanography; Reliefs of Ocean basins; Temperature, Salinity and Density of Ocean water; Ocean currents; Coral Reefs; Ocean Deposits and its multidisciplinary significance; Economic significance of Ocean resources.

Unit- IV: Law of the Sea; EEZ; Blue economy and India; Geostrategic importance of Indian Ocean, Problems, Prospects and Management Strategies.

Suggested Readings:

1. Barry; R.G. and Chorley P.J.; Atmosphere, Weather and Climate, Routledge, London and New York, 1998.
2. Critchfield, J.H.: General Climatology, Prentice Hall, India, New Delhi, 1993.
3. Das, P.K.: Monsoons National Book Trust, New Delhi, 1987.
4. Fein, J.S. and Stephens, P.N.: Monsoons. Wiley Interscience, 1987.
5. India Met. Deptt.: Climatological Tables of Observatories in India, Govt. of India, 1968.
6. Lal, D.S.: Climatology, Chaitanya Publications, Allahabad, 1986.
7. Lydolph, P.E.: The Climate of Earth, Rowman, 1985.
8. Menon, P.A.: Our Weather, N.B.T., New Delhi, 1989.
9. Peterson, S.: Introduction to Meteorology, Mc Graw Hill Book, London, 1969.
10. Robison, P.J. and Henderson S.: Contemporary Climatology, Henlow, 1999.
11. Thompson, R.D. and Perry, A (ed.): Applied Climatology, Principles and Practice, Routledge, London, 1997.
12. Davis Richard J.A. "Oceanography- An Introduction to the Marine Environment" Wm. C. Brown lowa, 1986.
13. Duxbury, C.A and Duxbury B; An Introduction to the world"s oceans. C. Brown, Lowa 2nd ed. 1996.
14. Garrison, T; Oceanography- An Introduction to Marine Science. Books/ Cole, Pacific Grove, USA, 2001.
15. Gross, M. Grant: Oceanography, a view of the Earth, Prantice- Hall Inc., New Jersey, 1987.
16. King, C.A.M. Oceanography for Geographers 1962.
17. Sharma, R.C. "the Oceans" Rajesh N. Delhi 1985.
18. Ummerkutty, A.N.P. Science of the Oceans and Human life. NBT, New Delhi 1985.
19. Tanaka, Yoshifumi, "The International Law of the Sea". Cambridge University Press, Year: 2019, ISBN: 110842421X,9781108424219
20. Rothwell, Donald; Elferink, G. Oude Alex; Scott, Nadine Karen; Stephens Tim. "The Oxford Handbook of the Law of the Sea". Oxford Handbooks in Law. 2015. 9780198715481, 019871548X

Pedagogy

- Weather and climate charts should be made available to the students to explain weather conditions. Audio-visual aids should be used for effective teaching.
- Detailed charts and maps showing oceanic relief, currents and circulation of oceanic water should be used for teaching. Audio Visual aids be provided for teaching.

GEOG: 202 **BIOGEOGRAPHY**

Credit Points: 4
Contact Hours: 4 hrs per week

Marks : 100
Sessional/ Mid- term: 40
End Semester Evaluation: 60

Objectives:

- To introduce the student the concept of Biogeography and its, interpretation. Informations and their application; interactions between living organisms with climate and physical environment, with special reference to India.

Course Contents:

Unit- I: Scope and development of Biogeography. Environment, Habitat and Plant-animal association, Plant successions. Zoogeography and its environmental relationship.

Unit- II: World Biome; Forms and functions, present issues and conservations of ecosystem: Aquatic, Forest, Grassland, and Mountain ecosystem.

Unit- III: Palaeobotanical and Palaeoclimatological records of environmental change. Proxies of palaeoclimate reconstruction with special reference to India.

Unit- IV: Environmental hazards in North-East India; Bio diversity and present problems and conservation strategies in North-East India, India's contribution on Polar Environmental Research.

Suggested Readings:

1. Agrawal, D.P.: Man and Environment in India Through Ages, Book & Books, 1992.
2. Cox, C.D. and Moore, P.D.: Biogeography: An Ecology and Evolutionary Approach 5 th edn, Blackwell, 1993.
3. Gaur, R.: Environment and Ecology of Early Man in Northern India, R.B, Publication Corporation, 1987.
4. Huggett. R.J.: Fundamentals of Biogeography. Routledge, U.S.A, 1998.
5. IIIies, J.: Introduction to Zoogeography, Mcmillan, London, 1974.
6. Mathur, H.S.: Essentials of Biogeography, Anuj Printers, Jaipur, 1998.
7. Pears, N.: Basic Biogeography, 2nd edn. Longman, London, 1985.
8. Tivy, J.: Biogeography: A Study of Plants in Ecosphere 3rd edn. Oliver and Boyd, U.S.A., 1992.
9. Meyen V. Sergei, "Fundamentals of Palaeobotany", Springer Netherlands. 1987. ISBN: 978-94-010-7916-7,978-94-009-3151-0
10. Robinson, W. J., Cook, Pilcher, E., J. R., Eckstein, D. "Methods of Dendrochronology: Applications in the Environmental Sciences". Springer Netherlands. 1990. ISBN: 978-90-481-4060-2,978-94-015-7879-0.
11. Lowe, Joseph John;Walker, Mike J C. "Reconstructing Quaternary Environments". Taylor and Francis; Routledge. 2015.
12. Bender, L. Michael L. "Paleoclimate". Princeton University Press. 2013. ISBN 9780691145556
13. Jyotiranjan S. Ray , M. Radhakrishna (editors). "The Andaman Islands and Adjoining Offshore: Geology, Tectonics and Palaeoclimate (Society of Earth Scientists Series)". Springer, Springer. ISBN 9783030398422.
14. Proceedings of the 10th International Symposium on Antarctic Earth Sciences, Polar Research Board, National Research Council, U.S. Geological Survey. "Antarctica: A Keystone in a Changing World". National Academies Press. 2008. ISBN: 0309118549,9780309118545.
15. Khadilkar, Jagadish. "Antarctica : The Frozen Continent's Environment, Changing Logistics and Relevance to India". 2017. Bloomsbury Publishing India Pvt. Ltd. ISBN: 9789386643001.
16. Singhvi, A.K. and Kale S. Vishwas. "Paleoclimate Studies in India: Last Ice Age to the Present". Indian National Science Academy. IGBP-WCRP-SCOPE-Report Series: 4. https://www.insaindia.res.in/pdf/Paleoclimate-Final_18-12-09-web.pdf.

Pedagogy:

- The students should be taken on field-visit to the local floral fauna zones, they should be acquainted with the local biogeography of the areas.
- Students may visit any national/foreign laboratory related to subject matter
- Seminars/lectures should be organized where speakers from the allied disciplines- environmental sciences, ecology, bioscience etc. should be invited to discuss with the students various issues of biogeography with a multidisciplinary approach.

GEOG: 203 POLITICAL GEOGRAPHY

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional/ Mid- term: 40**
End Semester Evaluation: 60

Objectives:

- To expose the students to the strategic importance of geographical parameters in the Political Science and International Studies at global, regional and local level.
- To sensitize the students to geopolitical dimensions and the understanding of conflicts and regional cooperation; and to make them familiar with the political geography.
- To introduce the Geopolitical importance of the North Eastern Regions of India, its geo-strategic positions, probable required regional and sub-regional co-operation and development.

Course Contents:

Unit- I: Nature, scope, approaches to study, historical development, major school of thoughts. Classical masters and their contributions.

Unit- II: Themes in Political Geography: State, Nation-State and Nation- building, Core-Periphery, Frontiers and boundaries, Colonialism and Neocolonialism.

Unit- III: Emerging themes in Political Geography: Geopolitics, Global strategic views, Heart land and Rimland theory, Globalization and Political Geography, Geopolitics of Peace, Confidence building and Conflict management.

Unit- IV: Political geography of contemporary India: basis of Indian federalism, Geopolitical significance of Northeast India with special reference to Nagaland. Locational imperative, Border issues and problems, identity and insurgency problems.

Suggested Readings:

1. Alexander, L.M. World Political Patterns Ran McNally, Chicago, 1963.
2. Adhikari, Sudepta. Political Geography, Rawat publication. N.Delhi 2017.
3. De Blij, H.J. and Glassner, Martin Systematic Political Geography, John Wile, New York, 1968
4. Dwivedi, R.L. and Misra H.N., Fundamentals of political geography, Sorjeet publications N.Delhi 2019.
5. Dikshit, R.D. Political Geography: A Contemporary Perspective. Tata McGraw Hill, New Delhi, 1966.
6. Dikshit, R.D. Political geography: A Century of progress, Sage, New Delhi, 1999.
7. Sukhwal, B.L. Modern Political Geography, of India Sterling Publishers, New Delhi, 1968.
8. Peter Taylor & Colin Flint. Political Geography, Pearson Education N. Delhi, 2004.
9. Michael Pacione. Progress in Political Geography, Croom Helm Ltd. Sydney Australian, 1985.
10. Taylor, Peter; Political Geography longman, London, 1985.
11. Fisher Charles A.: Essays in Political Geography, Methuen, London, 1968.
12. Pounds N.J.G.: Political Geography. McGraw Hill, New York, 1972.
13. John R.Short: An Introduction to Political Geography. Routledge, London, 1982.
14. Moddie, A.E: Geography Behind Politics Hutchinson, London, Latest edition.
15. Prescott. J.R.V.: The Geography of Frontiers and Boundaries Aldine, Chicago.
16. Deshpande C.D: India- A Regional Interpretation Northern Book Center, New Delhi, 1992.
17. Panikkar K.M.: Geographical Factors in Indian History: 2 Vol. Asia Publishing House, Bombay, 1959.
18. Pacione Michael; Progress in Political Geography, Croom Helm, London, 1985. Taylor, Peter, Flint Colon; Political Geography; World economy nation state and locality, Pearson Education, U.K., 2000.

Pedagogy:

- Students may be encouraged to have readings of journals, magazines and newspapers on various topics in order to update themselves with the latest development in the global, regional and local levels on the subject matter. They may be involved in discussions on the emerging political issues and attempt to provide geographical interpretation.

GEOG: 204 REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional / Mid- term: 40**
End Semester Evaluation: 60

Objectives:

- To introduce the students the basic principles of Remote sensing.
- To indicate the methods of visual and digital interpretations of satellite imageries.
- To outline the application value of remote sensing.
- To introduce GIS (Geographic Information System) as a tool of spatial science.
- To indicate the basic elements of GIS and methodology of GIS.
- To outline the steps and areas of application of GIS.

Course Contents:

Unit- I: Definition and Scope of Remote Sensing. Historical development of remote sensing as a technology- Relevance of remote sensing in Geography-Concepts and basics, remote sensing systems: platforms and sensors.

Unit- II: Satellite Remote Sensing: Platforms, LANDSAT, SPOT, NOAA, AVHRR, RADARSAT, IRS, INSAT. Sensors Type: Optical, Microwave, Hyperspectral, Thermal. Principles and geometry of scanners and CCD arrays, orbital characteristics and data products-MSS, TM, LISS I & II, SPOTLA & MLA, SLAR, High Resolution Sensors, Indian Space Exploratory Mission.

Unit- III: Spatial Science: Definition and development of GIS, computer environment for GIS. Geography as a spatial science, maps and spatial information, dynamics of spatial information, elements of information technology, geographic objects and their relations.

Unit- IV: Spatial Data: Elements of spatial data; data sources: primary and secondary, census and sample- data; raster and vector, data conversion-comparison of raster and vector databases. GIS Technology: GIS- remote sensing data as a data source for GIS and integration of GIS and Remote Sensing- GPS and GIS Digital Elevation Models (DEM and TINS), GPS Navigational Tracking.

Suggested Readings:

1. American Society of Photogrammetry: Manual of Remote Sensing...ASP, Falls Church, V.A., 1983.
2. Barrett E.C. and L.F. Curtis: Fundamentals of Remote Sensing and Air Photo interpretation, Mcmillan,New York, 1992.
3. Compell J.: Introduction to Remote Sensing, Guilford, New York, 1989.
4. Curran, Paul J.: Principles of Remote Sensing, Longman, London, 1985.
5. Hord R.M.: Digital Image Processing of Remotely Sensed Data, Academic, New York, 1989.
6. Luder D.: Aerial Photography Interpretation: Principles and Application, McGraw Hill, New York,1959.
7. Pratt W.K. Digital Image Processing. Wiley, New York, 1978
8. Rao D.P. (eds.): Remote Sensing for Earth Resources, Association of Exploration Geophysicist,Hyderabad, 1998.
9. Thomas M. Lillesand and Ralph W. Kefer. Remote Sensing and Image Interpretation, John Wiley &sons. New York, 1994.

Pedagogy:

- Students maybe taken to any nearby Remote Sensing Organization to observe different equipments, techniquesand products.
- Students maybe asked to visit any nearby ground area with its imagery and to compare the ground reality andthe corresponding reality in the imagery.
- They can convert this vector data into raster data and they maybe asked to observe the difference in the vector and raster data.
- Students maybe taken to any mapping organization and they can note the traditional and modern and computer-assisted cartography.
- Students maybe taken to any of the government or private departments which are using GIS as a tool, and theycan observe the methods and areas of application of GIS.

GEOG: 205 REMOTE SENSING TECHNIQUES AND COMPUTER CARTOGRAPHY

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional/ Mid- term: 40**
End Semester Evaluation: 60

Objectives:

- To introduce to the students the basic principles of Remote Sensing.
- To indicate the methods of visual and digital interpretations of satellite imageries.
- To outline the application value of remote sensing.

Course Contents:

Unit- I: Introduction of Software widely used for Remote Sensing (ARC GIS, QGIS, ERDAS, ENVI), Source of Remote Sensing Data, Data acquisition from the data sources, Difference between various imageries and bands, Application of UAV.

Unit-II: Air photos and Image interpretation- Elements of image interpretation and identification of objects. Landuse & Land cover, Urban landuse, Lineament, Landform and its processes identification and analysis. Vegetation cover, settlement types, transport network, weather studies, Water resources.

Unit-III: Comparison of features on Panchromatic and Multispectral imageries, True colour and False colour Composite and its interpretation. Band combination. Indices: Vegetation, water body and Glacier/Snow detection. Landuse landcover classification and validation.

Unit- III: Computer cartography- Components of computer cartography: hardwares & softwares. Computer assisted mapping: Principles and practices, Data sources: primary and secondary. Data Types: Raster and Vector. Vector data types and Database preparation in GIS software. Spatial analysis techniques and preparation of thematic layers using GIS. – mapping of physical, environment and socio-economic data.

Suggested Readings:

1. American Society of Photogrammetry, Manual of Remote Sensing. ASP, Falls Church, V.A., 1983.
2. Aronoff S. Geographic Information Systems: A Management Perspective, DDL Publication, Ottawa. 1989.
3. Barrett E.C. and L.F. Curtis, Fundamental of Remote Sensing and Air Photo Interpretation, Mcmillan, New York, 1992.
4. Burrough P.A. Principles of Geographic Information Systems for Land Resource Assessment Oxford University Press, New York. 1986.
5. Campell J. Introduction to Remote Sensing, Longman, London, 1989
6. Curran, Paul J. Principles of Remote Sensing, Longman, London, 1985.
7. David Unwin, Introductory Spatial Analysis, Methuen, London, 1981.
8. Fraser Taylor D.R. Geographic information Systems. Pergaman Press, Oxford, 1991.
9. Gregory, S. Statistical Methods and the Geographer, Longman, London, 1978.
10. Hammond R and P.S. McCullagh Quantitative Techniques in Geography: An Introduction, Clarendan Press, Oxford, 1974.
11. Hord R.M. Digital Image Processing Remotely Sensed Data, Academic, New York. 1989.
12. John P. Cole and Cuchlaine A.M. King, Quantitative Geography, John Wiley, London, 1968.
13. Johnston T.J., Multivariate Statistical Analysis in Geography, John Wiley, London, 1968.
14. Luder D, Aerial Photography Interpretation: Principles and Application, Mc Graw Hill, New York, 1959.
15. Maquire D.J. M.F. Goodchild and D.W. Rhind (eds.) Geographic information Systems: Principles and Application. Taylor & Francis, Washington. 1991.
16. Mark S Monmonier. Computer- assisted Cartography. Prentice-Hall, Englewood Cliff, New Jersey, 1982.
17. Peuquet D.J. and D.F. Marble Introductory Reading in Geographic Information Systems. Taylor & Francis, Washington. 1990.
18. Pratt W.K. U Digital Image Processing Wiley, New York, 1978.
19. Rao D.P. (eds.) Remote Sensing for Earth Resources, Association of Exploration Geophysists, Hyderabad, 1998.
20. Star J and J. Estes. Geographic Information Systems: An Introduction. Prentice- Hall, Englewood Cliff, New Jersey, 1994.
21. Yeats, Maurice An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York, 1974.

Pedagogy:

- Students maybe taken to any nearby Remote Sensing Organization to observe different equipments, techniques, and products.

- Students maybe asked to look into weather satellite photographs being published in the daily newspapers and to prepare some quick report of weather.
- Students maybe asked to visit any nearby ground reality and the corresponding reality in the imagery.

THIRD SEMESTER

GEOG: 301 **RESEARCH METHODOLOGY**

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional/ Mid- term: 40**
End Semester Evaluation: 60

Objectives:

- To understand how to achieve and explain the purpose of research.
- To understand the skills and knowledge to conduct independent research.
- To emphasize the importance of ethical conduct and research findings.
- To ensure research findings are valid and reliable and free from biases and errors.

Course Contents:

Unit- I: Concept on Knowledge, Research: Meaning, Definitions, Objectives, Characteristics and types, Formulation of statement of the problem, Steps involved in Research, hypothesis/research question.

Unit- II: Concept on Data, Method and Methodology, Techniques of data collection: Socio-economic survey and Physical/ Geomorphic Survey, Concept of Population and Sample, Sampling Techniques. Questionnaire preparation. Used of computer in data processing and mapping, SPSS.

Unit- III: Recent trends in Geographical Research: Presentation of Research Findings, Abstract & Report Writing, Research Paper (Seminars, Presentation Conferences), Journals Publication (Impact Factor, & Citation).

Unit- IV: Literature survey, Reviewing and Referencing System, Bibliography. Field studies/ surveys for case studies.

Suggested Readings:

1. Eyles, John and David M. Smith (1988), Qualitative Methods in Human Geography, Polity Press, Oxford.
2. Harvey, David (1969), Explanation in Geography, Edward Arnold, London. 4. Hubbard, Keith et al. (2002), Thinking Geographically, Continuum, London.
3. Hoggart, Keith et al. (2002), Researching Human Geography, Arnold, London.
4. Johnston, R.J. and J.D. Sidaway (2004), Geography and Geographers, Arnold, London.
5. Kidder, Louise H. (1981), Research Methods in the Social Relations, Fourth Editions, Hault-Saunders International Editions.
6. Kitchin, Rob and Nicholas J. Tate (2002), Conducting Research in Human Geography, Prentice Hall, London.
7. Krishnaswamy, and Ranganatham, (2005), Methodology of Research in Social Sciences, Himalayan Publishing House, New Delhi.
8. Limb, Melanie and Claire Dwyer (2001), Qualitative Methodologies for Geographers, Arnold, London.
9. Robinson, Guy M. (1998), Methods and Techniques in Human Geography, John Wiley, New York. 12. Scale, Clive (ed.) (2008), Social Research Methods, (Indian Edition), Routledge, London.
10. Somekh, Bridget and Cathy Lewin (eds.) (2005), Research Methods in the Social Sciences, Vistaar Publications, New Delhi.

GEOG: 302 APPLICATION OF REMOTE SENSING, GIS AND GPS IN GEOGRAPHY

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional / Mid- term: 40**
End Semester Evaluation: 60

Objectives:

- To familiarize the students on the application of spatial science.
- To highlight the significance of RS and GIS usage in studying the landforms, method and techniques used for analyzing and characterizing Earth system features.
- To understand the techniques used for studying various earth resources.
- To outline the application of remote sensing in resource management.
- To outline the important resource areas through application of RS and GIS.
- To develop a strategy for mapping earth resources.

Course Contents:

Unit- I: Geo- informatics for Earth Sciences, Types of Remote Sensing, Principles of Remote Sensing, GIS and GPS, Concept of Earth System Science. Platforms and sensors, Image interpretation elements.

Unit- II: Geo-informatics for Land Resources Management; Landuse mapping, Forest mapping and Monitoring, Agricultural Resource assessment, Geohazards studies- landslide, subsidence, Glacial lake outburst flow (GLOF), Flood. Geomorphic mapping.

Unit- III: Geo-informatics for Water Resources Management, Watershed delineation, Watershed analysis and Planning, Conservation and Planning for the development of Water Resources- use of surface and ground water resources, Ground water basin, hydrogeomorphic mapping, ground water potential and recharge zone mapping.

Unit- IV: Urban and Regional Planning, Geospatial technique in urban area analysis, rural landscape planning and management, transport network analysis. Site suitability mapping, Application of Remote Sensing., GIS and GPS for sustainable development of Nagaland and North East India.

Suggested Readings:

1. Bell, F.G., 1999. Geological Hazards, Routledge, London.
2. Bryant, E., 1985. Natural Hazards, Cambridge University Press.
3. Fetter, C. W. 2001, Applied Hydrogeology, Prentice Hall Inc.,NJ., U.S.A.
4. Fitt, C. R. 2006.Groundwater Science, Academic Press.
5. Jensen, John R., 2007. Remote Sensing of the Environment: An Earth perspective. Pearson education, Inc.
6. Keller, E.A., 1978. Environmental Geology, Bell and Howell, USA.
7. Patwardhan, A.M., 1999. The Dynamic Earth System. Prentice Hall.
8. Smith, K., 1992. Environmental Hazards. Routledge, London.
9. Thomas M. Lillesand and ralph W. Kefer. Remote Sensing and Image Interpretation. John Wiley and Sons. New York, 1994.
10. Valdiya, K.S., 1987. Environmental Geology - Indian Context. Tata McGraw Hill.
11. American Society of Photogrammetry: Manual of Remote Sensing.. ASP, Falls Church, V.A., 1983.
12. Barrett E.C. and L.F. Curtis: Fundamentals of Remote Sensing and Air Photo interpretation, Mcmillan, New York, 1992.
13. Compell J.: Introduction to Remote Sensing, Guilford, New York, 1989.
14 .Curran, Paul J.: Principles of Remote Sensing, Longman, London, 1985.
15. Hord R.M.: Digital Image Processing of Remotely Sensed Data, Academic, New York, 1989.
16. Jamir W. and Lanusosang T: Forest Atlas of Nagaland, GB Books, New Delhi, 2014
17. Luder D.: Aerial Photography Interpretation: Principles and Application, McGraw Hill, New York, 1959.
18. Nag P.: Thematic Cartography and Remote Sensing, Concept, New Delhi.
19. Pratt W.K. Digital Image Processing. Wiley, New York, 1978.
20. Bayliss Smith, T.P.: The Ecology of Agricultural Systems. Cambridge University Press, London, 1987.
21. Berry, B, J, L. et.al: The Geography of Economic Systems. Prentice Hall, New York, 1976.
22. Dyson, T.: Population and Food- Global Trends and Future Prospects. Routledge, London, 1996.
23. Gregor, H.P.: Geographer of Agriculture. Prentice Hall, New York, 1970.
24. Grigg, D.B.: The Agricultural Systems of the World. Cambridge University Press, New York 1974.

25. Hartshorn, T.N. and Alexander. J.W.: Economic Geography. Prentice hall, New Delhi, 1988.
26. Mannion, A.M.: Agriculture and Environment Change. John Wiley, London, 1995.
27. Morgan W.B. and Norton, R.J.C.: Agricultural Geography, Mathuen, London, 1971.
28. Morgan, W.B.: Agriculture in the Third World- A Spatial Analysis. Westview Press, Boulder, 1978.
29. Sauer, C.O.: Agricultural Origins and Dispersal. M.I.T. Press, Mass, U.S.A., 1969.
30. Singh, J. and Dhillon, S.S.: Agricultural Geography, Tata McGraw Hill Pub.; New Delhi, 1988.
31. Tarrant, J.R.: Agricultural Geography. Wiley, New York, 1974.
32. Brown, L.R.: The Changing World Food Prospects- The Nineties and Beyond. World Watch Institutes, Washington D.C., 1990.

Pedogogy:

- The teacher should impress the students the overall importance of the application Geo- informatics for natural resources management and sustainable development.
- Applications of Remote Sensing, GIS and GPS may be explained separately.

GEOG: 303 Massive Open Online Courses (MOOCS)
Total Marks: 50
Credits: 2

Students should complete an internship for atleast 2 weeks to 4 weeks from the 1st to 3rd semester (at any time), but the credit will be added in the 3rd semester only. It would be completed in any industry/research institute/University/ NGOs/civil societies for upgrading skills. Department may also customize it.

GEOG304: INTERNSHIP
Total Marks: 50
Credits: 2

Students should complete an internship for at least 2 to 4 weeks from the 1st to 3rd semester (at any time), but the credit will be added in the 3rd semester only. It would be completed in any industry/ research institute/university/ NGOs/ civil societies to upgrade skills.

GEOG: 305 **FIELD-WORK**

Physical Survey or Socio-economic Survey (Practical)

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional/ Mid- term: 40**
End Semester Evaluation:60

Students will select either Physical Survey or Socio-economic Survey in this Practical Course. Study Tour will carry 60 marks and will be compulsory for all students.

Field Work (Physical Survey)

Objectives:

- The main objective of the field work (Physical) is to conduct an extensive survey of a contiguous wider region and identify salient landforms; their genesis and their impact on human life, flora and fauna.

Course Contents:

Unit- I: Delineate the surveyed area with proper methods from the Topo sheet / Remote Sensing images / Aerial Photograph. Prepare Contour map, Identify landforms based on Contour, Identify the major geomorphic agents prominent on the study region. Identify and classify the biodiversity in the area (Flora & Fauna). Land Use/Landcover and weather elements.

Unit- II: Geomorphological equipment (Schmidt hammer, Clinometer, GPS, Auger corer), Meteorological equipment (AWS) and Hydrological (Physical and chemical properties measurement kit, Current meter) equipment uses and observations in the nearby field. Use of UAV. Report Writing based on the above observations.

Pedagogy:

- The practical exercises should aim an identification of micro-geomorphic features on the ground and their relationship to landuse/settlements patterns/meteorology and hydrology.
- This is also training in Report Writing.

Field Work Socio- Economic Survey (Practical)

Objectives:

- Main objective of the field work is to provide the students with the understanding of ground reality of a chosen village/ town by observation; mapping of land quality, land use and cropping pattern and conducting Socio-economic survey of the household with the help of a specially prepared questionnaire.

Course Contents:

Unit- I: Procure a topographic map of 1:50,000 or 1:25,000 scale to study the settlements selected its regional setting. Collect demographic, social & economic data of the village/town from Census Reports to study the temporal changes in the profile of such characteristics. Procure a cadastral map of the village/town for field mapping of the features of land- use and land quality. Procure/prepare the settlement-site map through rapid survey to map the residential, commercial, recreational (parks, playgrounds), educational, religious and other prominent features. Analyze Remote Sensing image and ground trothing during the field.

Unit- II: Conduct a socio-economic survey of the households with a structured questionnaire. Supplement the information by personal observations and perceptions. Based on results of the land-use and socio-economic enquiry of the households, Physical / Geomorphological survey, prepare a critical field- survey report. Photographs and sketches, in addition to maps and diagrams, may supplement the report.

Pedagogy:

- The exercise should familiarize the students with the basis socio-economic characteristics of the chosen area/ settlements through lab experiments, followed by field-visit and conducting enquiry at the village/town/household level.
- This is also training in Report Writing for the students

(Student will opt for any one paper from the listed five of Geog 306-310)

GEOG: 306 GEOGRAPHY OF NORTHEAST INDIA AND NAGALAND

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional/ Mid- term: 40**
End Semester Evaluation: 60

Objectives:

- To highlight the various components of north east region in terms of physical, ecological, social and cultural.
- To understand the spatial structure of development and explore the potentiality and geopolitical importance of the region.
- To understand the Geography of Nagaland in terms of locational imperative, physical, climate, natural vegetation, culture, challenges and strategy for development.

Course Contents:

PART-A Geography of North East India

Unit- I: Geographical Profile of North East India
Locational Imperative, Physiography, climate and Ecological Diversities.

Unit- II: People, culture and dominance of tribes/Ethnicity and Movements.
Development, Challenges and Opportunities, Role of North Eastern Council (NEC).

PART-B Geography of Nagaland

Unit-III: Geography of Nagaland
Locational Imperative, Physiography, Geology and Mineral Belt, Climate, Natural Vegetation

Unit-IV: People and culture, Indigenous Traditional Knowledge, Agriculture and Resources, Development, Challenges and potentials**.**

Suggested Readings:

1. Ahmed, A., "Linguistic Pattern of North Eastern Region", Language and Social and Regional Identities in India, CSRD, JNU, New Delhi, 1982.
2. AK Agarwal, Bhartendo Singh (ed) "Understanding India"s Northeast, DVS publishers Delhi, 2011.
3. Bardhan, A.B., Tribal problems in India, 1973.
4. Baruah, A.R., Geography of Assam
5. Bhuyan, M.C., "Trends in Population Growth in Assam", NEIGS, Vol.V No.1 and 2, Gauhati, 1973.
6. Bose, N.K., Tribal Situation in India, 1971.
7. Chaudhury, P.C., History of Civilization of Assam, Gauhati, 1960.
8. Das, H.P., Geography of Assam, Calcutta, 1926.
9. Gait, E., History of Assam, Calcutta, 1926.
10. Gopalakrishnan, R., Geography of Arunachal Pradesh, Gauhati.
11. Gopalkrishnan, R., Geography of Meghalaya, Delhi.
12. Gopalkrishnan, R., Northeast Region, Vikas, New Delhi.
13. Lanusosang, T., Social Geography of Nagaland, Gauhati
14. L.S.Gassah & CH.Thomas "Democracy and Development in India"s Northeast Challanges and Opportunities, ICSSR, NER, July, 2015.
15. Jamir, W., Aos of Nagaland, Mittal, New Delhi.
16. Monirul Hussain (2008) "Interrogating Development State, Displacement and population Resistances in Northeast India, Sage publication, New Delhi.
17. Rao, S.N.," Geographical factors in Cultural History of Northeast .India", Seminar on Resource Base and Problems of Regional Devlopment of Northeast Region of India, NEHU, Shillong, 1977.
18. Raza,M., Tribal Atlas of India, 1989.
19. Singh,B and Bhandari, J.S., The Tribal World: In Transformation, New Delhi, 1980.
20. Singh, K.S., Triabl Situation India, IIAS, Shimla.
21. Singh, R.L. (ed)., Regional Geography of India.
22. Spate, O.H.K., India and Pakistan.

GEOG: 307 NATURAL HAZARDS AND DISASTER MANAGEMENT

Credit Points: 4
Contact Hours: 4 hrs per week

Marks : 100
Sessional / Mid- term: 40
End Semester Evaluation: 60

Objectives:

- To provides basic conceptual understanding of natural hazards and disasters.
- To highlight approaches of Disaster Management.
- To familiarize on the skills to respond to disaster.
- To highlight the significance of Remote Sensing and GIS usage in Disaster preparedness.

Course Contents:

Unit- I: **Concept of Natural Hazards and Disasters:** Definition, Classification of Disasters: Natural Hazards and Disaster (Flood, cyclone, Heat and Cold Waves, Cloudburst and Lightning, Anthropogenic hazards (Chemical spills from industries, wildfire, transport hazards), Biological and Disasters (Nuclear radiation, biological warfare).

Unit- II: **Occurrence, Causes and Spatial Dimension of Natural Hazards and Disasters**. Natural Hazards and relationship with geomorphic processes; Landslides, and Glacial Lake Outburst Floods, and Earthquakes.

Unit- III: **Disaster Management and Role of Remote sensing and GIS:**
Basic principles of disasters management; Vulnerability assessment and Risk analysis with respect to various disasters; Application of Remote sensing and GIS in Natural Hazard Zonation Mapping (HZM), Risk Reduction Measures (RRM); Early Warming Systems.

Unit- IV: **Disaster Management Related Polices and Institutions**.
Disaster (Natural/Anthropogenic) Mitigation, Preparedness, response and Recover; Role of government bodies, Armed forces and media in disaster management; Institutional Framework: NDMA, NDRF; Community planning and education in particular to North-East India.

Suggested Readings:

1. Keith S., 2013. Environmental Hazards - Assessing Risk and Reducing Disaster, Routledge, New York.
2. Bell F.G., 2003. Geological Hazards: Their Assessment, Avoidance & Mitigation, Taylor and Francis.
3. Nicolas R. Dalezios, 2017. Environmental Hazards: Methodologies for Risk Assessment and Management, IWA publisher.
4. Musavi, Syed Hyder Abbas, 2019. Early Warning-Based Multihazard and Disaster Management Systems
5. Shailesh N., Sisi Z., 2008. Remote Sensing and GIS Technologies for Monitoring and Prediction of Disasters
6. Bankoff, G., G. Frerks and D. Hilhorst (eds.) 2003. Mapping Vulnerability: Disasters, Development and People, Earthscan.
7. Nasim Uddin, Alfred H. S. Ang, Nasim Uddin, Alfred H. S. Ang, 2011. Quantitative risk assessment (QRA) for natural hazards, ASCE.
8. Tomaszewski, Brian, 2014. Geographic Information Systems (GIS) for Disaster Management, CRC Press.
9. Collins, Larry R., 2001. Disaster Management and Preparedness, Lewis Publishers.
10. Cutter, Susan (ed). 1993. Environmental Risks and Hazards, Pearson.
11. Drabek, Thomas, 2010. The Human Side of Disaster, Taylor and Francis
12. Government of India, 2005. Disaster Management Act, 2005, The Gazette of India, New Delhi.
13. Kapur, Anu, 2008. On Disasters in India, Cambridge University Press.
14. Kapur, Anu, 2010. Vulnerable India: A Geographical Study of Disaster, Sage.
15. Parasuraman, S. 2004. India Disasters Report: Towards a Policy Initiatives, Oxford University Press.
16. National Centre for Disaster Management, 2001. Report of the High Powered Committee (HPC) on Disaster management, New Delhi, http://nidm.gov.in/PDF/pubs/HPC_Report.pdf.
17. Sassa, Kyoji, 2005. Landslides: Risk Analysis and Sustainable Disaster Management, Springer
18. Tripathi, Punam, 2018. Vulnerable Andaman and Nicobar Islands: A Study of Disasters and Response, Routledge.
19. United Nations, 2004. Living With Risk: A Global Review of Disaster Reduction Initiatives.
20. Wisner, B., P. Blaikie, T. Cannon and I. Davis, 2004. At Risk: Natural Hazards, Peoples' Vulnerability and Disasters, Routledge (Second Edition).
21. World Disasters Report, http://www.ifrc.org/en/publications-and-reports/world-disastersreport/

GEOG: 308 **GEOGRAPHY OF TOURISM**

Credit Points: 4 **Marks : 100**
Contact hours: 4 hrs per week **Sessional/ Mid- term: 40**
End Semester evaluation: 60

Objectives:

- To familiarize the students with aspect of tourism which have a bearing on subject matter of geography.
- To orient the student/ researcher to the logistics of tourism industry and the role of tourism in tourism in the national/regional development.
- To understand the impact of tourism on physical and human environment.
- To explore the cultural and ecological potential for tourism in the North Eastern region of India and to provide a strategy plan for its development.

Course Contents*:*

Unit- I: Basics of Tourism – Definition and Concepts of Tourism, Factors influencing Tourism –Physical, Cultural, Historical, Pilgrimage, Recreation. Elements of Tourism as an Industry.

Unit- II: Classification of Tourism and Tourist – Domestic and International Tourism, Adventure, Pilgrimage, Medical, Historical, Cultural, Business, Leisure and Pleasure, Eco-Tourism, rural Mass and Alternative tourism etc. Impact of Tourism- Social, Cultural, Economic, Environmental perceptional Positive and Negative Impact.

Unit- III: Infrastructural Approach for Development of Tourism – Mode of Transport, Agencies, Hotels and Resorts, Home Stays. Role of Foreign Capital and Impact of Globalizations on Tourism. Environmental Laws and Tourism, Government Policies for Promotion and Development of Tourism in India.

Unit- IV: North East Region and Tourism – Tourism development with special emphasis in Cultural and Eco-tourism. Case Study of some important Places, Cultures and Festivals in the Region. Infrastructure and support base, strategy planning.

Suggested Readings:

1. Ashok Alma, Vinay Chauhan etc. (Eds)Contemporary trends in tourism and hospitality management, 2022.
2. Anil Verma 2010, Emerging trends in tourism SBS publisher N. delhi.
3. Bhatia, A.K. (1996), Tourism Development: Principles and Practices, Setrling Publishers, New Delhi, 1996. 2. Bhatiya, A.K. (1991), International Tourism - Fundamentals and Practices, Sterling, New Delhi.
4. Carter, E. and Lowman, G. (1994), Ecotoursim, John Wiley and Sons, New York.
5. Chandra, R.H. (1998), Hill Tourism: Planning and Development, Kanishka Publishers, New Delhi, 1998. 5. Hunter, C. and Green, H. (1995), Tourism and the Environment: A Sustainable Relationship, Routledge, London.
6. Dilip M.R., 2020 Tourism concept theory and practisesm, Wiley India , N. Delhi.
7. Inskeep, E, (1991), Tourism Planning: An Integrated and Sustainable Development Approach, Van Nostrand and Reinhold, New York.
8. Kamra, K.K. and Mohinder Chand (2007), Basics of Tourism: Theory, Operation and Practice, Kanishaka Publishers, New Delhi.
9. Kaul, R.K. (1985), Dynamics of Tourism & Recreation, Inter-India, New Delhi.
10. Kaur, J. (1985), Himalayan Pilgrimages & New Tourism, Himalayan Books, New Delhi.
11. Lea, J. (1988), Tourism and Development in the Third World, Routledge, London.
12. Milton, D. (1993), Geography of World Tourism, Prentice. Hall, New York.
13. Sharma, J.K (eds) "Tourism, Planning and Development: A new perspective. Kanishka (2000).
14. Raza Moonis (editor) Regional Development Heritage Publishers Delhi, 1988.
15. Mishra, R.P. et.al. Multi- Level Planning Heritage Publishers, Delhi, 1980.

Pedagogy:

- The students should be made to do sessional assignments based on diverse data to formulate regions at the local, regional levels and identify the regional differentiations.
- They should be made conversant with the trends in the development of the regional concepts, using „space" in the multi disciplinary approach to regional development.

GEOG: 309 **CULTURAL GEOGRAPHY**

Credit Points: 4 **Marks : 100**
Contact Hours: 4 hrs per week **Sessional/ Mid- term: 40**
End Semester Evaluation: 60

Objectives:

- To understand the diversity of culture in the world as well as in India.
- To comprehend the diffusion of various ethnic traits and religions.
- To understand the relationship between the cultures and patterns of living and economic development.

Course Contents:

Unit- I: Introduction: Nature, Scope and Development of Cultural Geography; Cultural Element and Components of Culture; Convergence and Divergence Processes; Cultural Changes: Perception, Behaviouralism and Cultural Relativism.

Unit- II: Themes and Concepts: Cultural Diversity: Cultural Area, Cultural Region, Cultural Diffusion, Cultural Integration, Cultural Ecology and Cultural Landscape.

Unit- III: Cultural Realms: Cultural Realm of America, Africa, South East Asia with special reference to India (with respect to Historical Evolution, Ethnic, Religion, Language, etc.)

Unit- IV: Cultural Changes: Modernization, Industrialization and Technological Changes; Economic Activities and Cultural Adaptations; Impact of Globalization and Cultural Continuity.

Suggested Readings:

1. Broek J.C. and Webb, J.W: A Geography of Mankind, McGraw Hill, New York, 1978.
2. Crang, Mike: Cultural Geography, Routledge publications, London, 1998.
3. Harmandorf, Tribes of India: The Struggle for Survival, Oxford University Press, Delhi, 1989.
4. Hazra, (ed.), Dimensions in Human Geography, Rawat Publication, Jaipur, 1997.
5. Hutchinson, and Smith, D: Ethnicity; Oxford University press, Oxford, 1996.
6. Jordon & Lester G: The Human Mosiac, Harper & Row, New York; 1979.
7. Massey, D & Jess P. A Place in the World: Places, Cultures and Globalization Oxford University, New York, 1995.
8. Massey, et.al (ed.), Human Geography Today, Polity Press, Cambridge, 1999.
9. Mukherjee, A.B. and Aijazuddin, A: India: Culture, society and Economy, Inter- India Publication, New Delhi, 1985.
10. Steve.P & Michael.K (ed.): Places and the Politics of Identify, Routledge, London, 1993.
11. Schwartzberg, J.E: Historical Atlas of South Asia, University of Chicago, 1978.
12. Singh, A.K: Approaches to Tribal Development, Swarup and Sona, New Delhi, 1994.
13. Sopher, D.E: Exploration of India: Geographical perspective on Society & Culture, Longman, London, 1980.

Pedagogy:

- Students may be introduced to the cultural elements of society/groups from various regions through dance-drama-cultural shows, arts exhibitions and field-visits.
- They should be asked to prepare seminar papers on the issues/problems confronting various cultural groups in India.

GEOG: 310 **AGRICULTURAL GEOGRAPHY**

Credit Points: 4 **Marks : 100**
Contact hours: 4 hrs per week **Sessional/ Mid- term: 40**
End Semester evaluation: 60

Objectives:

- To familiarize the students with the concept, origin, and development of agriculture; to examine the role of agricultural determinants towards changing cropping patterns, intensity productivity, diversification and specialization.

- Its objective is also to discuss environmental, technological and social issues in agricultural with special reference to India.

Course Contents:

Unit- I: Nature, Scope and development of agricultural geography, approaches to the study of agricultural geography, agricultural regionalization, spread of agricultural technology.

Unit- II: Determinants of agricultural land use: Physical determinants of agricultural landuse- the terrain, the climate, the soil and the water resources, Non- physical determinants of agricultural landuse- Technological factors, population characteristics, cultural factors and infrastructural services of relevance to agriculture, Cropping pattern, Crop Combination regions, agricultural productivity, Green revolution- its impact and consequences.

Unit- III: Theories of agricultural based on several multi-dimensioned factors: Von Thunen‟s theory of agricultural location and its modifications, Whittlesey‟s classification of agricultural regions, spatial diffusion models.

Unit- IV: Agricultural Spatial pattern, Green revolution, White revolution, agricultural policy and their implications, food security, role of irrigation, fertilizers, insecticides, pesticides and technological know- how, Shifting cultivation in Northeast India.

Suggested Readings:

1. Bayliss Smith, T.P.: The Ecology of Agricultural Systems. Cambridge University Press, London, 1987.
2. Berry, B, J, L. et.al: The Geography of Economic Systems. Prentice Hall, New York, 1976.
3. Brown, L.R.: The Changing World Food Prospects- The Nineties and Beyond. World Watch Institutes, Washington D.C., 1990.
4. Dyson, T.: Population and Food- Global Trends and Future Prospects. Routledge, London, 1996.
5. Gregor, H.P.: Geographer of Agriculture. Prentice Hall, New York, 1970.
6. Grigg, D.B.: The Agricultural Systems of the World. Cambridge University Press, New York 1974.
7. Hartshorn, T.N. and Alexander. J.W.: Economic Geography. Prentice hall, New Delhi, 1988.
8. Mannion, A.M.: Agriculture and Environment Change. John Wiley, London, 1995.
9. Morgan W.B. and Norton, R.J.C.: Agricultural Geography, Mathuen, London, 1971.
10. Morgan, W.B.: Agriculture in the Third World- A Spatial Analysis. Westview Press, Boulder, 1978.
11. Sauer, C.O.: Agricultural Origins and Dispersal. M.I.T. Press, Mass, U.S.A., 1969.
12. Singh, J. and Dhillon, S.S.: Agricultural Geography, Tata McGraw Hill Pub.; New Delhi, 1988.
13. Tarrant, J.R.: Agricultural Geography. Wiley, New York, 1974.

Pedogogy:

- The teacher should impress the students the overall importance of agriculture in the global perspective.

FOURTH SEMESTER

GEOG: 401 **RESEARCH PROJECT**

Credit Points: 12 (12+2)
Contact Hours: 12 hrs per week

Marks : 200
Sessional/ Mid- term: 80
End Semester Evaluation: 120

Research Project will be compulsory for all students. During the Third Semester Topic of the project and Supervisor will be allotted to the students. Before the commencement of Fourth Semester Examinations students have to submit their Project Report to the Department for End Semester Evaluation. Broader research capacity will be employed with the help of Internship (Online/offline) as per the guidance in a other departments/institutions. The betterment of research quality will be enhanced by the encouraging intra-department and inter-institutional research capacity. For completion / submission of their Project report, students will present their pre-submission seminar in front of the Departmental Research Committee (DRC).